Creek Data Tracker

Collect local water data and graph changes over time

ENV.2.6 "Enrichment: Obtain water from a local source (e.g., stream on campus, rainwater, ditch water) to monitor water quality over time, using a spreadsheet program to graphically represent collected data."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the steps that keep the water tests comparable, circle the measurements students record, and number the steps for turning their results into a graph. These marks will help you plan your own water study.

Four Mondays at the Creek

1. At a creek beside the school, a science class wants to track nitrate in water over four weeks. With teacher approval, students collect samples from the same reachable bank each Monday, without stepping into the water. They use clean bottles, record the collection time, and note rain from a nearby gauge. They never drink the water.

2. In the lab, students test each sample with the same nitrate kit and follow its timing directions. The results, reported as milligrams of nitrate per liter, appear in the table. Students enter their dated readings in a spreadsheet, then make a graph that shows how nitrate changes across visits. Keeping the method consistent makes comparisons more useful.

CREEK MEASUREMENTS

Visit date	Rainfall in previous 24 hours (mm)	Nitrate (mg/L)
Oct. 5	0	1.2
Oct. 12	2	1.5
Oct. 19	20	4.8
Oct. 26	0	2.1

3. Rain can wash material from streets, fields, or soil into a creek, but a rain gauge does not measure what actually entered the water. Nitrate readings can also change with fertilizer use, wastewater, or stream flow. When evaluating a graph, look for patterns and unusual points, then consider what more sampling might reveal before claiming a cause.

2 ANSWER WITH EVIDENCE

Use the passage

1. To graph nitrate across the four visits, what belongs on the horizontal axis and what belongs on the vertical axis? Include the nitrate unit.

2. What date, rainfall, and nitrate values would you enter in one spreadsheet row for the third visit?

3. How much did nitrate change from the first visit to the last? Name the two readings you compared.

4. A student says rain caused the highest nitrate reading. Why do the table and passage not establish that claim?

3 YOUR TURN

Your own words

With teacher approval, collect water from one safe local source on three different dates, test nitrate with the same kit each time, and record your actual results in the table. Enter your results in a spreadsheet and create a line graph with date and nitrate (mg/L) as its axes; below the table, write one sentence describing a pattern or explaining why more data are needed.

SAMPLE DATE	NITRATE (MG/L)

ANSWER KEY

Creek Data Tracker

PART 1 · READ AND MARK

Underline the steps that keep the water tests comparable, circle the measurements students record, and number the steps for turning their results into a graph. These marks will help you plan your own water study. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	To graph nitrate across the four visits, what belongs on the horizontal axis and what belongs on the vertical axis? Include the nitrate unit.	**Horizontal axis: visit date. Vertical axis: nitrate (mg/L).**
2	What date, rainfall, and nitrate values would you enter in one spreadsheet row for the third visit?	**Oct. 19; 20 mm of rain in the previous 24 hours; 4.8 mg/L nitrate.**
3	How much did nitrate change from the first visit to the last? Name the two readings you compared.	**It increased by 0.9 mg/L, from 1.2 mg/L on Oct. 5 to 2.1 mg/L on Oct. 26.**
4	A student says rain caused the highest nitrate reading. Why do the table and passage not establish that claim?	**The highest rainfall and nitrate readings coincide on one visit, but one coincident high-rain/high-nitrate reading cannot establish causation. Other factors could affect nitrate.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Example student record from a separate rain barrel study:
Nov. 2 | 0.8
Nov. 9 | 1.0
Nov. 16 | 0.9
Spreadsheet line graph: horizontal axis, sample date; vertical axis, nitrate (mg/L).
Nitrate rose slightly and then fell, so more samples are needed to tell whether there is a lasting pattern.

Part 3 requires the student's own dated measurements, not values copied from the passage or sample. Check the separate spreadsheet graph for correctly plotted data and labeled axes; accept a cautious sentence supported by the student's results.